Claims

I Claim:

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1. A corrosion resistant brine fluid comprising:

water;

a source of water soluble cations where the cations are selected from the group consisting of lithium, sodium, potassium, calcium, zinc, ammonium, cesium, rare earths, and mixtures thereof to form a brine with the water; and

an additive selected from the group consisting of ammonia, an amine, a salt thereof, a compound capable of generating ammonia, an amine, and a salt thereof, and mixtures thereof where the ammonia, amine, or salt thereof is present in an amount effective to raise the pH of and increase the corrosion inhibition of the brine.

2. The corrosion resistant brine fluid of claim 1 where the density of the brine ranges ~~from~~ about 8.4 to about 22.5 pounds/gal (about 1.0 to 2.7 kg/l).

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3. The corrosion resistant brine fluid of claim 1 where the source of water soluble cations is a salt selected from the group consisting of chloride, bromide, acetate, and formate salts having cations selected from the group consisting of lithium, sodium, potassium, calcium, zinc, ammonium, cesium, and mixtures thereof.

4. The corrosion resistant brine fluid of claim 1 where the source of water soluble cations is a source of water soluble zinc cations.

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5. The corrosion resistant brine fluid of claim 4 where the source of water soluble zinc cations salt is selected from the group consisting of zinc chloride and zinc bromide.

6. The corrosion resistant brine fluid of claim 1 where the additive is selected from the group consisting of ammonia, alkyl or aryl amines of the formula $R^1R^2R^3N$, where R^1, R^2, and R^3 are independently selected from the group consisting of hydrogen, or hydrocarbon radical or substituted hydrocarbon radical, where the substituent is selected from the group consisting of oxygen, sulfur, nitrogen, halogen and mixtures thereof; where the sum of the number of carbon atoms in R^1, R^2, and R^3, if any, is 20 or less; ethylenediamine; aniline; and mixtures thereof.

7. The corrosion resistant brine fluid of claim 1 where the additive is ammonia.

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8. The corrosion resistant brine fluid of claim 1 where the additive is a source capable of generating ammonia, an amine or a salt thereof, selected from the group consisting of hydroxylamine, hydrazine, amides, azoles, piperidines, piperizines, aziridines, azides, betaines, amino acids, ureas, guanidines, tetramethylenehexamine, salts thereof, and mixtures thereof.

9. The corrosion resistant brine fluid of claim 1 where the additive is present in a mole ratio to water soluble cation ranging from about 0.05/1 to about 2.0/1.

10. The corrosion resistant brine fluid of claim 1 further comprising at least one additional corrosion inhibitor.

11. The corrosion resistant brine fluid of claim 1 further comprising at least one hydroxy carboxylic acid complexing agent.

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12. A corrosion resistant brine fluid comprising:

water;

a source of water soluble cations where the cations are selected from the group consisting of lithium, sodium, potassium, calcium, zinc, ammonium, cesium, rare earths, and mixtures thereof to form a brine with the water; and

an additive selected from the group consisting of ammonia, alkyl or aryl amines of the formula $R^1R^2R^3N$, where R^1, R^2, and R^3 are independently selected from the group consisting of hydrogen, or hydrocarbon radical or substituted hydrocarbon radical, where the substituent is selected from the group consisting of oxygen, sulfur, nitrogen, halogen and mixtures thereof; where the sum of the number of carbon atoms in R^1, R^2, and R^3, if any, is 20 or less; ethylenediamine; aniline; and mixtures thereof, where the additive thereof is present in an amount effective to raise the pH of and increase the corrosion inhibition of the brine;

where the density of the brine ranges from about 8.4 to about 22.5 pounds/gal.

13. A method for increasing the corrosion resistance of a brine fluid comprising:

providing a brine comprising:

water;

a source of water soluble cations where the cations are selected from the group consisting of lithium, sodium, potassium, calcium, zinc, ammonium, cesium, rare earths, and mixtures thereof to form a brine with the water; and

adding an additive selected from the group consisting of ammonia, an amine, a salt thereof, a compound capable of generating ammonia, an amine, and a salt thereof, and mixtures thereof, to provide an amount of ammonia, amine, or salt thereof, effective to raise the pH of and increase the corrosion inhibition of the brine.

14. The method of claim 13 where in providing the brine, the density of the brine ranges from about 8.4 to about 22.5 pounds/gal (about 1.0 to 2.7 kg/l).

15. The method of claim 13 where in providing the brine the source of water soluble cations is a salt selected from the group consisting of chloride, bromide, acetate, and formate salts having cations selected from the group consisting of lithium, sodium, potassium, calcium, zinc, ammonium, cesium, and mixtures thereof.

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16. The method of claim 13 where in providing the brine the source of water soluble cations is a source of water soluble zinc cations.

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17. The method of claim 16 where in providing the brine the source of water soluble zinc cations salt is selected from the group consisting of zinc chloride and zinc bromide.

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18. The method of claim 13 where in adding the additive, the additive is selected from the group consisting of ammonia, alkyl or aryl amines of the formula $R^1R^2R^3N$, where R^1, R^2, and R^3 are independently selected from the group consisting of hydrogen, or hydrocarbon radical or substituted hydrocarbon radical, where the substituent is selected from the group consisting of oxygen, sulfur, nitrogen, halogen and mixtures thereof; where the sum of the number of carbon atoms in R^1, R^2, and R^3, if any, is 20 or less ethylenediamine; aniline; and mixtures thereof.

19. The method of claim 13 where in adding the additive, the additive is ammonia.

20. The method of claim 13 where in adding the additive, the additive is a source capable of generating ammonia, an amine, or a salt thereof, selected from the group consisting of hydroxylamine, hydrazine, amides, azoles, piperidines, piperizines, aziridines, azides, betaines, amino acids, ureas, guanidines, tetramethylenehexamine, salts thereof, and mixtures thereof.

21. The method of claim 13 where in adding the additive, the additive is present in a mole ratio to water soluble cation ranging from about 0.05/1 to about 2.0/1.

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22. The method of claim 13 further comprising adding at least one additional corrosion inhibitor.

23. The method of claim 13 where in adding the additive, the additive is added in a controlled manner by contacting the brine with the additive in a vapor.

24. The method of claim 13 further comprising adding at least one hydroxy carboxylic acid complexing agent.